

WITH THE AUTHOR'S COMPLIMENTS

ASSOCIATED AND RELATED
OCULAR AND DENTAL DISEASES.

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BY

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Institute of Great Britain ; Ophthalmic Surgeon to North West London
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St. Bartholomew's Hospital.*

Reprinted from the "Transactions of the Odontological Society of
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Associated and Related Ocular and Dental Diseases.

BY WILLIAM JOB COLLINS, M.D., M.S., B.Sc., F.R.C.S.

Ophthalmic Surgeon to North West London and Western Ophthalmic Hospitals ; Surgeon to London Temperance Hospital.

THIS communication is the result of a request by my former colleague, Mr. Maggs, that I should read a paper before your Society. My work for the last ten years having been largely in ophthalmic practice, I was led to think of those points where your specialty touches mine. I am fully aware this subject has been brought to the notice of this Society in a paper communicated by Mr. Power in 1883, and which occasioned a valuable discussion. This paper was declared by one of the speakers to be "the most complete collection of facts bearing upon this important subject which had yet appeared in the English language," and by others to deal with facts hitherto little known or inadequately appreciated.

In the remarks which I offer to-night on associated and related ocular and dental diseases, I do not lay claim to be either comprehensive or dogmatic, but rather suggestive and critical. My attention was early directed to the alleged rela-

tion of dental lesions and eye diseases, chiefly by Mr. Power, whose house surgeon I was at the time he read you his paper; and I have kept myself keenly alert to discover the truth about the relationship during the eight years which have since elapsed, and during which I have been engaged in the ophthalmic practice of four or five different hospitals.

Logically, it is no easy matter to establish conclusively a causal nexus between ocular and dental diseases. Bain truly observes, "Nowhere more than in medicine may laws of causation be defeated; there is rarely such a thing as a simple cause yielding a simple effect. Hence the necessity of ascertaining whether a coincidence is more frequent than would be accounted for by chance." The elimination of such chance is sought in statistics. Thus Power says, "I have noticed that a large proportion of the children who have phlyctenular ophthalmia also have carious teeth; surely this is very suggestive of the ætiology of the affection." He states his belief in a causal connection between the two; yet on another page he recognises the ambiguity of such conclusion, owing to "the extreme frequency with which dental affections present themselves." Here, then, statistics are of little avail, and we are compelled to resort to a deductive method of proof, and invoke the aid of a judicious empiricism. Beyond a general notion that phlyc-

tenulæ are herpetic, and that herpes is somehow neurotic, and if neurotic, associated somehow with dental irritation, there is probably little basis for any such idea.

On the other hand Hutchinson, from an examination of 102 cases of interstitial keratitis, was able to arrive at the induction that this disease was due to inherited syphilis, and was very frequently accompanied with a characteristic physiognomy and definite dental irregularity. The same author's demonstration* of the remarkable concomitance of laminar cataract and defective enamel, especially of the first molars, and Arlt's connection of the former with infantile convulsions, is not less suggestive of some underlying relation between ocular, dental and general nutritional aberration. Whether the chain of relationship is that mercurial powders given for the convulsions cause the dental peculiarities, while the cataract is referrible to the convulsions, and not to the mercury is, to say the least, very doubtful.

When we come to cases where far commoner and less specific dental disease exists as a possible or part cause in some lesion of the eye, we can only proceed upon known anatomical lines and proved physiological facts.

Apart from such cases as antral disease, which

* *Path. Soc. Trans.*, vol. xxvi., p. 235.

places teeth and eye in direct pathological relation, we look to the innervation of the respective organs as affording a bond of connection. Bearing in mind the destination of the whole of the second, third, fourth, sixth, and parts of the fifth and seventh cranial nerves, together with the sympathetic supply to the eye and orbital contents, eyelids and muscular appurtenances, and the associated rich innervation of the teeth by the other two large sensory divisions of the great trigeminal nerve, we cannot fail to appreciate the opportunity of intercommunication afforded. Accepting the truths which physiology teaches of reflex action, of transference, of radiation, of so-called "sympathy," we are led to expect, *à priori*, that under certain circumstances conditions must arise in which afferent impulses ascending the dental nerves shall manifest divers sensory and motor phenomena in the complex system composing the organs of vision.

There are affinities developmental, histological and general between the eyes and the teeth which must not be lost sight of when taking a broad view of the two factors whose inter action we seek to investigate.

Developmentally, an analogy by no means fanciful may be found in the fact that with the eyes, as with the teeth, an epiblastic invagination co-

operates with a vascular mesoblastic intrusion in the genesis of the organ. A liability to sympathetic tendencies and lesions may thus be laid at the outset. The connecting link of non-vascularity of the dentine and enamel and cornea and lens—a peculiarity shared by the other epidermal appendages, such as skin, nails, hair, scales and feathers—is worthy of remark. The correspondence of the two sets of phenomena may be less true in point of time than in essence, and in their later life-histories there is little of analogy between the cyclic changes of the two dentitions and the age changes which eventuate within the eyes.

No doubt it would be possible, though hardly profitable, to discuss my subject by proceeding *seriatim* through the twenty-two pages, ninety-eight genera (to say nothing of species) of diseases of the eye, and the seven pages, thirty-seven genera (to say nothing of species) of diseases of the teeth set forth in the revised nomenclature by the Royal College of Physicians; and then, by the aid of catalogues and indexes, and the ransacking of medical reports and transactions, to cite recorded cases of alleged inter-dependence of every one of one series with some one or other of the other series. I respect the honour of addressing you too highly to presume upon your patience to that extent.

A more practical line of approach would be to classify all associated and related ocular and dental lesions into (1.) Those due to direct pathological sequence, of which antral abscess from dental caries and necrosis with orbital cellulitis,* or an antral tumour causing proptosis,† may be taken as a type, and (2.) Those due to indirect pathological sequence, almost necessarily nervous in its mechanism, of which certain spasmodic affections of muscles of the eye may be taken as constituting a typical group. Alongside and outside this dichotomous division would be associated tooth and eye troubles from developmental causes, diathetic causes, morbid or other selective influences excited by virtue of histological or nutritional affinity.

Following this broad outline, I shall lay before you some cases, of which I have collected notes during the past ten years, some cases recorded by others, which help to complete the exposition, choosing such only as are recorded with critical care and sufficient fulness.

Many cases of the indirect class, especially such as were recorded before the days of the ophthalmoscope, and before Donders demonstrated the pathology of concomitant squint—which

* S. Snell, *Trans. Ophth. Soc.*, vol. x., p. 51.

† Mr. Lloyd Williams' case, *Trans. Odont. Soc. of Great Britain*, vol. xxii., No. 2, p. 49.

means before the early sixties—are of little value. Some are truly miraculous, and may be regarded as apocryphal. Some recorded as reflex amaurosis may be more reasonably regarded as coming under the first class of direct inflammatory extension. The case which Sir Wm. Lawrence,* in his “Diseases of the Eye” and Mackenzie, in his large work, quote from Galenzowski, and which Mr. Power told you he considered to be the most brilliant and complete on record of reflex amaurosis from irritation of dental branches of the fifth, may be a case in point. It was that of a man aged thirty, in whom a splinter of wood had perforated the fang of the first left upper molar, which was carious; swelling and pain of the cheek of that side occurred, and later on mydriasis and blindness, which is said to have been complete; this lasted a twelve-month, when the cause was detected by Galenzowski and the tooth with splinter removed, and restoration of sight quickly ensued. There is history in this case of repeated discharge of spoonfuls of pus in the neighbourhood of lower eyelid, probably from empyema of the antrum, with necrosis of the orbital plate. Galenzowski, who relates the case (*Archives Générales de Méd.*, tom. xxiii., 1830) seems to admit this,

* Lawrence, “Treatise on Diseases of the Eye,” 1854, p. 616.

but concludes from the case that the fifth nerve (as Magendie taught) participates in vision and supplies motor power to the iris! Mackenzie,* who, in citing the case, magnifies the intruding splinter from three lines to three inches, puts it down apparently as reflex retinal congestion. The possible effect of orbital cellulitis directly upon the optic nerve and the striking and rapid improvement of sight after evacuation of inflammatory effusion is well shown in a case recorded by Mr. Critchett in *Ophthalmological Transactions*, vol. vi., p. 155, to which I shall again allude.

I would remark here that, notwithstanding a fairly abundant literature of a not very precise or definite sort, rather of what may be termed the "fluffy" order, cases of definite ocular disease for which a dental cause can be satisfactorily established are very decidedly rare. I have searched the ten extant volumes of the Ophthalmological Society in vain for a clear case of the kind I class in my second group. I find a case of fatal orbital cellulitis resulting from periodontitis and necrosis of the jaw.† I find associated neuralgia or anæsthesia of the fifth, with ocular troubles (vol. viii., p. 254; vol. v., 193), and a reference to a possible dental cause of herpes

* "Diseases of the Eye," 1854, p. 1078.

† Vol. x., p. 54.

facialis (vol. vi., p. 400); but no reflex amaurosis, no phlyctenular ophthalmia, no glaucoma, no ophthalmoplegia, no failure of accommodation attributed with any assurance or proof to dental lesion.

Now Mr. Power's comprehensive paper,* which laid under contribution most of the available literature on the subject up to that date, yet only contained two detailed cases which had come within the author's own experience. One was a young woman with neuro-paralytic ulcer of the cornea, who was in St. Bartholomew's Hospital when I was house surgeon, and of which I took full notes; she had corneal anæsthesia, and ulceration with hypopyon, and though it is true there was some improvement after taking out some teeth, yet the eye subsequently had to be abscised. The other case was one of double glaucoma, in which a cystoid cicatrix followed each iridectomy, and both eyes were lost. She had had toothache, "and an abscess was always found to exist at the root." I do not gather that Mr. Power either suspected or asserts dental cause in this case, nor does our extending knowledge of the pathology of glaucoma suggest it as likely. Indeed, Mr. Priestley Smith, by measuring the tension of the eye in cases of toothache at the Dental Hospital, found no reason for thinking

* *Trans. Odont. Soc.*, vol. xvi., 1884, pp. 11-56.

that toothache affected ocular tension, and though his observations were but few, yet there seems good ground for his conclusion "that the part played by ordinary forms of facial neuralgia in glaucoma is not of primary importance."†

In the full and valuable discussion which followed Mr. Power's paper, I can only find records of eight cases of oculo-dental lesion contributed by the sixteen speakers. Mr. Smith Turner related a case of amaurosis from antral abscess. Mr. Charters White mentioned a case of keratitis with a carious bicuspid; Mr. Coleman amaurosis from pivoting a left upper central, and added conjunctivitis was the commonest ophthalmic trouble resulting from dental irritation. The amaurosis case appears to be the same one referred to on page 21, vol. xix., of the *Odontological Society's Transactions*, where it is stated by Mr. F. J. Bennett, on the authority of Mr. Lawson, that the ocular trouble was iritis and in no way due to reflex dental irritation. That conjunctivitis is the commonest ocular affection associated with diseased teeth I have no doubt, for it is the commonest ocular disease, and carious teeth being common too, it is not uncommon to find the two commonplaces in the same person; but surely coincidence and not causation is responsible for such concurrence. Mr. Macna-

† "Glaucoma," 1879, p. 10.

marra, an ophthalmic surgeon of large experience both in this country and in India, could not say that he had ever met with disease of the eye due to dental irritation.

Mr. Spence Bate related a case of neuralgia in the eye relieved by the removal of carious upper molars. Mr. Gibbons told of a case of amaurosis "most marvellously improved" after removal of teeth with exostoses. Mr. A. Coleman had seen a case of malignant disease of antrum accompanied by toothache and failing sight. Mr. C. Tomes had himself experienced supra-orbital neuralgia and appearance as of "looking through running water," coincident with aching of some upper stumps and cured by their extraction. A possible explanation of this would be a radiation through superior dental to supra-orbital and lacrima branches of fifth. Mr. S. J. Hutchinson referred to a case of lagophthalmos in a lady who had disease of molars on same side. From a subsequent report (vol. xviii., p. 7), we learn improvement followed the removal of the upper first molar, which had been imperfectly stopped. Reflex irritation of the third nerve was here diagnosed, though in the absence of spasm of any of the other four muscles supplied by this nerve, and from the description of the case, I would suggest that spasm of the muscle of Müller, the unstriped fibres of the orbit supplied by the sympathetic, is possibly a more likely explanation.

Dental surgeons are evidently on the alert for cases of the kind of which I am speaking, yet the records in your *Transactions* are few and far between.

Mr. Henry Sewill, the same night as Mr. Power's paper,* related a most interesting case, which was the only case of the kind he had seen, and which he reproduces in his work on "Dental Surgery." It was a case of spasm of the orbicularis, neuralgia, and cataract, apparently due to tender, carious and much neglected teeth on the same side. Appropriate treatment of the teeth cured the spasm and neuralgia, but of course not the cataract.

A similar case of facial spasm, with closure of the lids and neuralgia, due to caries, with abscess of the upper molars of same side, is recorded by Mr. W. C. Boyd Wallis, in vol. xviii., p. 173, of *Odontological Society's Transactions*.

On Dec. 6, 1886, Mr. Hern communicated to this Society† a case which I sent to him from Mr. Lawson's out-patients at Moorfields, in which I suspected that severe localised supra-orbital neuralgia, and possibly the diplopia which was present, were due to carious upper molars of the same side. The removal of the second and stopping of the third molar cured the neuralgia,

* *Trans. Odont. Soc.*, vol. xvi., p. 8.

† *Trans. Odont. Soc.*, vol. xix., p. 18.

though the diplopia continued when looking down two months afterwards.

Mr. Newland-Pedley, speaking on this case, wisely cautioned against too great eagerness to trace "amaurosis" to bad teeth, relating a case in which such relation was suspected, but which proved on investigation to be due to malingering, the sight being excellent. I have known several such, even in young persons, where the assertion of blindness of one eye was as obstinately alleged as it was distinctly disproved. No doubt in pre-ophthalmoscopic and less critical days such cases would pass as "amaurosis," which then meant little else than that patient and oculist alike saw nothing, and in which the moral effect of extraction without an anæsthetic no doubt produced very rapid and startling cures.

I have not found in your *Transactions* of recent years any further cases bearing upon my subject, although the valuable communication by Dr. Ferrier "On some Relations of the Fifth Cranial Nerve," viewed in the light of Gaskell's research, suggests some of the paths of inter-communication by reflexion and radiation.

In the discussion which the pathology of sympathetic ophthalmia has occasioned it has been recognised that a nerve, besides establishing a conductive relationship between parts, may also by virtue of its lymphatic sheath, or possibly its

more essential structure, afford a path for the propagation of an inflammatory process, whether we consider this of bacterial origin or not. The other theory of sympathy, viz., an identity of action towards some selective morbid poison administered to like parts, is less applicable to the subject in hand unless indeed the "rachitic" and syphilitic teeth on the one hand, and cataract and keratitis on the other, own some such subtle link.

Dealing first with cases of ocular troubles from direct pathological sequence starting from dental causes I may quote the following from my note books:—

Edith C., aged six, with irregular carious primary molars, and ulceration and necrosis of alveolus of the superior maxilla, suffered from what was called erysipelas of that side of the face, with much swelling, proptosis of the globe and chemosis of conjunctiva; there was said to be dimness of vision, but no neuritis was observed. An incision in the orbit through the lower eyelid let out 3i. of pus, and the symptoms rapidly subsided. I have notes of two similar cases; in one the pus was intensely foetid; in the other necrosis of the margin of the orbit followed, and some ectropion from adhesion to bone resulted, and required operation. A fourth case, in a woman aged twenty-three, was complicated with syphilis and gummatous nodes within the orbit and necrosis of

superior maxilla, neuro-retinitis resulted with complete optic atrophy. Salter* relates a similar case in which the floor of the orbit with the infra-orbital canal came away as a sequestrum. Pollock, Brück† and Gaine‡ have also recorded instances of amaurosis from orbital cellulitis, arising from antral abscess or periodontitis and maxillary periostitis secondary to carious teeth. Snell has published three cases recently, one of which terminated fatally. Critchett had a somewhat similar case in which there was great proptosis, free incisions only evacuated serum but gave great relief, and vision, which at one time was quite lost, completely returned; the other eye went through something like a sympathetic iritis. A year later another attack threatened, but extraction of a painful tooth appeared to cure it, then for the first time it was discovered that the patient, a girl aged sixteen, had eleven of her second upper set still uncut.

Tumours, innocent and malignant, involving the antrum, and osseous growths in leontiasis ossium, of which I have noted two cases, may occasion ocular and orbital neuralgia, displacement of the globe and diplopia, and even optic atrophy.

A case I watched with close interest may

* Salter, "Dental Pathology and Surgery," 1874, p. 273.

† *Annales d'Oculistiques*, 1856.

‡ *British Medical Journal*, part cclxi., p. 683.

serve as a transitional one to the indirect group. J. G., aged fifty-eight, suffered intense trigeminal neuralgia on the right side. Yet on testing it was found he had anæsthesia of all the parts supplied by the three sensory trunks of the fifth, including the eye, nose and mouth. There was no conjunctivitis, the pupil dilated to nearly twice the size of the fellow; the lens exhibited a diffuse nuclear cataract; the cornea, though quite anæsthetic, was perfectly clear, and remained so for some months. He had some carious stumps on the right side which were extracted by my then colleague, Mr. Maggs, without pain or benefit. Later the cornea clouded, and there were the appearances of neuro-paralytic destruction of the globe. The pain was markedly relieved by stretching the superior maxillary nerve, which I performed without an anæsthetic. Later I excised the right eye, also without an anæsthetic and without the least pain. There was no palsy of the motor portion of the fifth. I diagnosed a lesion in the Gasserian ganglion, or nuclear. I cite the case as showing the projection of pain at some distance from the lesion, and a probable relation between an irritative lesion of the fifth and cataract, as well as the more recognised corneal troubles. This case lends support to the one of Mr. Sewill's in which neuralgic blepharospasm

and cataract resulted apparently from irritation of the superior dental nerve.

I have notes of several cases of tonic trismus from spasm of the masseter and temporals due to imbedded wisdoms; this is a well-recognised reflex spasm, I believe, but I refer to it as helping to elucidate orbicular spasms from dental irritation. Irritation of sensory branches of the fifth may occasion either radiation of neuralgic pains to other branches of the same cranial nerve, as in localised supra-orbital neuralgia in Charles H., whom I sent to Mr. Hern for extraction of offending upper molars, or so-called reflex spasm, when motor branches of the same nerve are affected, causing spastic contraction of the temporals and masseters. It is only a short step from this to facial spasm, or spasm of the external rectus, the seventh and sixth nuclei being in close company with the motor root of the fifth in the pons Varolii.

Amelia D., aged sixty, had intense tonic spasm of the left orbicularis palpebrarum, with clonic exacerbations, which also partly involved the other muscles of that side. I found a painful carious canine, pressure upon which was acutely tender, and intensified the spasms. I advised removal, but regret she did not return to report the result. Mr. Boyd Wallis' case reported in vol. xviii. of your *Transactions*, p. 173, appears to be of the

same class as this. I have seen at least six or seven such cases, and have for some years pointed out the dental causation of blepharospasm.

Emma Shaw, aged twenty-five, complained in March, 1885, that for six months the right upper eyelid had been retracted, showing the sclera above the cornea. The eye could be closed easily, but in ordinary states a peculiar staring appearance resulted. This she dated very emphatically from the extraction of some upper teeth of the same side, which occasioned great suffering. There was slight enlargement of right lobe of the thyroid, and I was inclined to regard the symptoms as due to irritation of the cervical sympathetic, which supplies the muscle of Müller, contraction of which (as we may see in the cocainised eye), produces lagophthalmos. Mr. S. J. Hutchinson's case, which I have referred to, seems to me a parallel case.

I have never seen a case of glaucoma, acute or chronic, which appeared to be in any way caused by disease of the teeth; though of course neuralgia of the head and cheek is common enough in such cases. I remember a curious case of intense supra-orbital neuralgia which was puzzling; later, however, the neuralgia gave way to total anæsthesia over the area of distribution of the supra-orbital nerve. On deep pressure a lump

was felt, evidently involving the supra-orbital nerve trunk; this was removed, was as large as an almond, and was composed of granulation tissue; there was a history of syphilis, and it was possibly a node.

I have paid a good deal of attention to failure of the accommodation, and, notwithstanding the statements of H. Schmidt, I much doubt whether dental neuralgia has any other effect in this direction than that of general depression, and consequently, as with so many other depleting causes, as blood losses, the puerperal state, hyper-lactation, convalescence from exhausting fevers, in a measure restricts the range of accommodation. In sixteen persons suffering from toothache tested by Priestley Smith, fifteen had no anomaly of accommodation.

Nor do I think paralytic affections of the external or internal muscles of the eye or lids are often, if ever, traceable to dental disease. A reflex paralysis presents some physiological difficulties, and a reference to "inhibition," which seems to imply interference with some tonically exerted motor influence, does not elucidate the matter to my mind.

I also must confess to scepticism as to the satisfactory demonstration of cases of reflex amaurosis arising from irritation of the dental nerves, apart from direct extension of inflamma-

tion through the maxilla. Such cases become more frequent in literature as we recede into pre-ophthalmoscopic and less critical times, and become rarer and seem to disappear when they are most vigilantly and critically inquired for. The deep origins of the optic nerve, though not precisely determined, would appear to be far removed from the fifth, and the path of such reflex amaurosis becomes proportionately circuitous and improbable.

Of associated ocular and dental lesions, such as keratitis and notched teeth, and lamellar cataract and "rachitic" teeth, every ophthalmic surgeon has abundant instances at hand. I would here remark, however, that it is curious to notice how often many who should know better appear to confound the triple denticles which the permanent incisors exhibit normally when first cut, and which often remain some years before they are ground down, with the Hutchinsonian notched teeth of hereditary syphilis. It is, possibly, by the defective enamel of the central denticle causing this to be broken away that the notched appearance results, and I exhibit a photograph which serves, I think, to illustrate this process.

I regret that this paper has grown to a length which I did not intend; I regret that it is open to the objection of being deficient in constructive-

ness; I am aware that while some regard all oculo-dental disorders with a wholesome scepticism, others are apt to concede to them undue importance. I have attempted to decide justly between such extremes; I am led to emphasize the importance of orbital and ocular troubles with direct pathological relation to dental diseases; to relegate to a less proven category reflex amauroses and the like while recognising the undoubted existence of certain reflex spasms and radiated neuralgiæ, which oculists must look to the dentists to explain and cure.

